LIBRARY
RECEIVED
MAR 27 1922

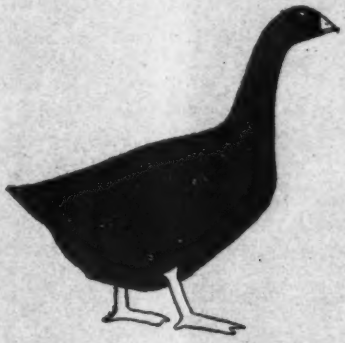
The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD
DEVOTED EXCLUSIVELY TO CITRUS FRUITS

Issued Monthly

Representative of every interest~
Representing no special interest

Vol. 3 No. 3 TAMPA, FLA., MARCH, 1922 15 Cents a Copy



Some growers prefer to sell on the tree, some prefer other methods.

Every grower AIMS to get the most money for his crop. Whether you sell on the tree or not your fruit will ultimately be shipped by somebody and sold in some distant market.

If you produce high class fruit and YOU prefer to ship it and get the benefits of the markets, choose your marketing agent with care.

It will pay you to consult us regarding your crop.

American Fruit Growers Inc.

Orlando, Florida

The Citrus Grower's Truck Problem Solved by the New Traffic

In the development of new groves and in the handling of work on groves already brought to bearing, one of the most serious problems the Florida growers have had to confront has been that of securing a truck which would meet every demand made upon it in the heavy sands of the citrus region.

To the solution of this problem, the manufacturers of the TRAFFIC TRUCK set themselves months ago. As a result they have brought out the new 6,000-pound capacity TRAFFIC, the most powerful, the most dependable and the most efficient truck on the market.

Equipped with dual transmission, this new TRAFFIC develops a pulling power hitherto undreamed of by truck manufacturers or truck users. With TEN SPEEDS FORWARD AND SIX SPEEDS REVERSE, the driver of this new TRAFFIC has an absolute speed control unapproached by any other truck.

In this latest model TRAFFIC TRUCK, the Florida citrus grower finds the realization of his most cherished hopes in truck equipment.

NO LOAD TOO HEAVY; NO SAND TOO DEEP FOR THIS NEW 6,000-POUND CAPACITY TRAFFIC TRUCK

This new 6,000 Pound-Capacity Traffic Truck, delivered in Tampa, equipped with pneumatic equipment for

$2450

With the dual transmission as an extra, this truck has ten speeds ahead and six reverse, making it the greatest pulling motor on the market at any price.

Write, wire or phone us for information or demonstration.

The Traffic Truck Sales Co.

State of Florida Distributors

1609-11 Franklin St. TAMPA, FLA. Phone 4820

The Citrus Industry
THE ONLY PUBLICATION IN THE WORLD DEVOTED EXCLUSIVELY TO CITRUS FRUITS
Issued Monthly
Representative of every interest—
Representing no special interest

Vol. 3 TAMPA, FLORIDA, MARCH, 1922 No. 3

Melanose Control

By J. R. Winston and J. J. Bowman,
Office of Fruit Disease Investigation,
U. S. Department of Agriculture

Leaves and twigs of oranges and grapefruit are susceptible to melanose infection for a relatively short time while very young, perhaps not more than several weeks, but fruit is susceptible for a considerably longer time. In the great majority of years, conditions which favor severe infection occur in May, after the leaves have become resistant and while the fruit is still quite susceptible. When protracted rainy periods occur at an earlier date, infection of both fruit and foliage may be expected. In the neighborhood of Orlando the melanose infection on fruit prior to May first during the past eight years has been negligible, except in 1918 when there were a number of rains during the latter part of April.

Fortunately the chances for severe infection earlier than May first are rather slight, possibly not more than one in seven or eight. Under such circumstances, the main consideration is to protect the fruit from infection which is likely to occur at any time in May and may occasionally take place in late April or until the middle of June. The simplest and most satisfactory way to prevent this infection is to spray with a strong, lasting fungicide.

Control

The control of melanose is still in the experimental stage. A hard and fast spray schedule is premature, never-the-less a brief summary of the spraying tests conducted by the Office of Fruit Disease Investigations, United States Department of Agriculture, may be of interest and possibly of value to those growers who wish to spray for protection against melanose infection on fruit.

As far back as 1894, Swingle and Webber controlled melanose by spraying in the neighborhood of Citra and Stanton. In 1917, spraying experiments were started but due to war conditions were not completed. The results were striking but not entirely satisfactory. In 1920 and again in 1921, very satisfactory results were obtained. Perfect control was obtained during both seasons on plots receiving two and three applications of Bordeaux-oil; while good commercial control was secured each year by a single application of Bordeaux-oil properly timed. These results were obtained not only on experimental plots but also by commercial growers at several points in the State, following the indications of 1917 and 1920.

The following schedule is suggested for trial with the belief that it will give satisfactory results in an average season. Further experiments are necessary to determine whether unusual weather conditions in certain years will require modification of this schedule.

Tentative Spray Schedule for Control of Melanose on Citrus Fruits

Application	Time	Material	Object
No. 1	April 1-10*	3-3-50 Bordeaux mixture plus 1% oil. **	To protect young fruit against melanose.
	May 1-10		
No. 2		Do.	Do.

CAUTION:—Insecticidal applications must follow the use of Bordeaux-oil emulsion to prevent serious scale injury. The regular May and Fall spraying for insects would accomplish this. (See U. S. Dept. Agric. Farmers' Bulletin 993).

* On small properties where spraying can be rapidly completed, it may be possible to control melanose with a single application made immediately on the very first detection of melanose on the young fruit. Close observation and prompt spraying are necessary if this plan is followed, and it involves a risk of failure if attack is very severe at the outset.

** Three gallons oil emulsion (Government formula, or equivalent) in 200 gallons Bordeaux mixture gives 1% oil.

Commercial Bordeaux mixtures, either paste or powder if used with equivalent copper content, (See U. S. Dept. Agric. Farmers' Bulletin 994 "Commercial Bordeaux mixtures. How to calculate their values!") should be expected to be about as effective as home made Bordeaux mixture. Occasionally, commercial Bordeaux mixture does not mix satisfactorily with oil emulsion. In this case add about one pound of hydrated lime to each fifty gallons of diluted Bordeaux mixture before adding the oil emulsion. The various oil emulsions made in Florida have thus far mixed very nicely with alkaline Bordeaux mixture.

Many growers prefer to make up their own spray materials, in which event to prepare a 3-3-50 Bordeaux mixture the following plan is suggested for 200-gallon outfits:

A Prepare stock solution of bluestone by suspending 50 pounds in a

sack at the top of a 50-gallon barrel of water.

B x Slake 50 pounds of quicklime into a thick paste and make up to 50 gallons.

C x Measure out 12 gallons (carrying 12 pounds of lime) of the stock solution of lime, after thoroughly stirring and pour through a strainer into the spray tank about three-fourths full of water.

D After stirring the stock solution pour 12 gallons (carrying 12 pounds of bluestone) of the stock solution of bluestone into the tank while the agitator is running.

E Add the oil emulsion while the Bordeaux mixture is being agitated. Complete filling of tank with water. Three gallons oil emulsion (Government formula or equivalent) in 200 gallons Bordeaux gives 1 per cent oil. Run agitator while spraying.

Preparation of Boiled Oil Emulsion, Government Formula

(See U. S. Department of Agriculture Farmers' Bulletin 993).

Paraffin oil	2 Gals.
Water	1 Gal
Fish Oil Soap	2 Lbs.

Put oil, water and soap into a kettle or other vessel that will stand fire, and heat to the boiling point. While still very hot, but after removal from fire, pump the material into another vessel with a bucket pump and then pump back again.

x If the grower prefers to use hydrated lime, 16 pounds of it may be substituted for 12 pounds of quick-lime, using the following procedure instead of steps (B) and (C): Run agitator while filling spray tank; when the water has risen to about the level of the agitator, sift the hydrated lime powder in gradually; by the time the tank is three-fourths full the 16 pounds should be all in, and the agitator will have churned it into a suitable milk of lime. Then proceed with step (D) above.

Citrus Facts

(By Alvin Fox)

Irrigation of Grove

The necessity, or desirability, for artificial water supply for groves, must depend entirely on locality. In California it is absolutely indispensable, wherever orange growing is a commercial industry. In Florida it is frequently provided as protection against damage from drought, which often occurs soon after the young fruit has set and occasionally results in serious dropping.

Methods in the two states are wholly unlike, as conditions are unlike and direct objects are different. In California ditch irrigation is the sole form practiced. In Florida the general level of the country, and very porous nature of the soil, render ditches useless. Piping the groves and the overhead spraying of the trees, in the guise of artificial rain is usually resorted to where the natural supply of water is augmented. Artesian and pumped surface water are both utilized. The month of May is about the only time when an artificial water supply is ever found desirable. Only a very small proportion of the groves are provided with facilities for irrigation.

California has generally adopted the furrow system. About four furrows are run between the rows of trees; the water is allowed to flow slowly. Care is exercise , that the water does not come in direct contact with the trunks of the trees. Scalding and "Foot-rot" would be apt to follow. Cultivation must be thorough and follow the water as soon as the surface is dry enough to work.

The so-called irrigation hard-pan formerly so serious a detriment to California groves, and for which subsoiling was believed to be the only remedy, is now effectively overcome or prevented. The immediate result of sub-soiling, was serious damage from the destruction of feeder roots. The present practice is to run three furrows a foot deep between the rows. Water is allowed to run slowly through these furrows for several days, till the sub-soil is wet and softened. The surface still remains so dry that it may be worked. The furrows are cultivated full of dry soil. Evaporation is prevented and water conserved. The deep irrigation overcomes the hard-pan results from frequent and constant shallow watering and cultivation to a single depth.

Pruning Facts.

Within a few years a radical change in the general practice of pruning has taken place. Formerly trees were made to branch high, with clean tall trunks. The heads were thinned out to admit access of sunlight. Now low dense heads are the decided preference.

The shading of the ground around the tree, thus preventing the soil moisture from evaporation; prevention of sun baking the soil; ability to support heavier crops without propping; and greater accessibility of fruit, resulting in easier picking, are the chief gains from low-headed trees. Protection of the trunk from damage from sunscald, is also secured. Thinning out of what was formerly considered as superfluous growth is now practically abandoned for the same reason. Protection of young fruit from hot winds is a further gain .

Branches and sprouts which seriously mar the symmetry of the trees, may be removed, but the pruning knife is becoming less and less in evidence in the best managed groves. All necessary pruning should of course be done while the trees are dormant. Wounds should be painted or otherwise protected from the air.

However successful the grower may be in producing fruit, the real success of his business will finally depend on the skill used in harvesting and marketing his crop. A few of the salient points influencing results will be presented.

Clip, never pull the fruit. The stem should be cut close up to the orange that danger of puncturing neighboring oranges may be avoided. Pick into hand or shoulder baskets and at every stage handle each orange with care. Only fully ripe fruit should be picked. Unlike many other fruits the ripening of oranges never continues after they are removed from the tree.

Two distinct classes are recognized, and should be strictly adhered to, namely "Brights" and "Russets". The latter is a distinctly Florida product. At least two grades of each class should be made. The standard grades of California are; Fancy, choice and standard. Oranges should cure in the packing house from two to seven days before being packed to allow toughening of the skin. Wrap in a good quality of tissue paper, preferably with design or trade-mark stamped thereon.

Only oranges of a single size may be packed in a box together. They should be accurately sized by machine. The standard sizes, which refer to the number which a box will contain, are as follows; 96, 112, 126, 150, 176, 200. 216, 250 ,300. The standard box only should be used, its dimensions are: 11½ by 11½ by 26 inches, inside measure. Boxes should be filled solid with fruit in rows with broken spaces, and project from 1-2 to 3-4 of an inch above the edges so that the top may exert pressure and keep the fruit in place.

The outside of the box should always be correctly stencilled with grade, size, variety and address of grower. In this way it is possible to establish a reputation and demand which will have a distinct money value to the producer of GOOD FRUIT.

A Daylight Packing House

"Bob White" oranges, which attracted such favorable attention at the American Fruit Growers, Inc., exhibit at the South Florida Fair at Tampa and the Sub-Tropical Mid-Winter Fair at Orlando, are being packed this season in the new packing house at De-Leon Springs built by Mr. Theodore Strawn to replace the one that was destroyed by fire about a year ago.

Mr. Strawn's new building is completely fire-proof in every detail. The floors, piers and like supports are reinforced concrete and the remainder of the structure is of steel and glass. The building is of the "sawtooth" type, and with its long rows of ventilated steel sash in the roof, and all four side walls constructed entirely of steel sash and glass, the building affords the utmost value in both lighting and ventilation. All glass used throughout the building is of the heavy "factory ribbed" quality which, because of the ribs in the glass, diffuses the light entering the building, and with the white painted walls and roofing, floods the building with sunlight. The total glass area is about 5,000 square feet. Thus it is that this packing house can be called a "daylight packing house."

The dimensions of this splendid structure are seventy-eight feet wide by one hundred and forty-two feet in length. This gives something over 11,000 square feet in floor space, which is ample for the placing of all necessary machinery and fixtures and giving an abundance of space for the movements of the employes. The building is one story in height, thereby insuring the same desirable condition of light and ventilation for every porton of the structure, which is a very important consideration.

Under the concrete floor a tunnel was constructed to receive the driving shaft that connects with the several machines of the packing house proper. This is a very important contrivance that gives great satisfaction as compared with over-head shafting.

Arrangements are provided for ready access to this tunnel to enable workmen to give proper attention to the shafting and fixtures.

The power building is detached from the main structure and is 25x40 feet in size. The walls and roof are corrugated sheet iron. An engine of ample capacity supplies the motive power for operating the machinery. Steam for heating purposes is generated in a large boiler of modern pattern and construction.

At another location on the grounds is a large building, enclosed with corrugated sheet iron that is used for a storage for box material and for the making of the boxes. For a number of reasons, this arrangement is an advantage over the usual custom of storing such material and manufacturing the boxes in the main building of the plant. This process also has an important bearing in the matter of liabilities in case of fire.

THE LAST WORD IN PACKING HOUSE ARRANGEMENT

The complete plan for this plant contemplates the transportaton of the completed boxes from the factory to the fruit packers by automatic conveyors.

The equipment of this model packing house comprises the latest improved and best type of machinery in every detail.

In a number of the most essential particulars, especially as pertaining to the processes of washing, drying and coating the fruit with paraffin, the de-

vices and methods employed in this plant are original with Mr. Strawn, being the result of very careful experimentation and study for many years.

As fruit is received from the groves it is first dumped into a tank of moving water. By an ingenious device the water is made to issue from the sides of a pipe with the force of a swiftly moving current. This current gently moves the fruit forward to the washers. It then starts on a journey of about 250 feet before it finally reaches the hands of the packers. During this journey the fruit is subjected to the several processes of scrubbing, rinsing, drying, grading and sizing by mechanical devices that perform those functions in a manner that borders on the miraculous.

With all of these processes performed in an exceedingly efficient manner the safety of the fruit is perfectly guarded, so that it is free from even the slightest injury and reaches the packing boxes in perfect condition, ready for packing for shipment to the consumers.

The method that is employed in the scrubbing and rinsing of the fruit is decidedly superior to that which is found in other packing houses. The work is more thoroughly accomplished, and at the same time the fruit is handled with such care that no possible injury is inflicted. The process must needs be seen to be appreciated.

Perhaps the most remarkable instance of superiority is in the drying of the fruit. It is first subjected to a blast of cold air while being elevated by a moving roller platform. Each individual fruit is turned over many times, meanwhile the blast of cold air clears it of every particle of movable moisture.

The device and method for the application of warm air to the fruit in operaton at this plant is the invention of Mr. Strawn, and is not found in any other packing house. The fruit travels a distance of forty feet, being propelled by an exceedingly ingenious device, meanwhile each piece is turned over and over hundreds of times, and subjected to a current of warm air. The result is that the fruit is brought to a state of perfection so far as drying the external surface is concerned. While the drying process is absolutely efficient, the handling of the fruit is performed so carefully that no possible injury is indicted. An egg can be passed through the entire forty feet of this wonderful dryer and the shell not be cracked.

By arrangement with the American Fruit Growers, Inc., electric marking machines have been installed and each fruit is marked. By this means consumers are given assurance of the identity of the grower. With his brand well and favorably established in the prominent markets of the North, the marking of his fruit still further enhances the value of his trade mark.

The entire output of this packing house, consisting of approximately 135 cars, is being handled this season by the American Fruit Growers, Inc. The average returns to Mr. Strawn this season for his entire crop, he states, will be the highest ever obtained by him.

Use Sulphur for Red Spiders

By J. R. Watson

Especially during spring, red spiders attack many plants, unless sulphur in some form is applied. They live upon a variety of plants, their favorites among cultivated ones being peas, beans, strawberries, citrus, cotton, violets and camphor.

Infested plants become gray or brown and dried-up in appearance and finally may turn yellow and die. Strawberries turn brown and remain small and hard. If examined closely, infested plants, particularly the under sides of the leaves, are found covered with a web of fine silk under which the minute yellowish mites can be seen with the naked eye. Under a strong lens one can readily see the eight-legged adults (which vary from red to green in color), their bright red eggs, and their white skins which are cast off when the spiders molt.

These pests belong to the spider class and to a group of small spiders called spider-mites, which includes the rust mite of citrus.

The best remedy for any of these mites is some form of sulphur. One may use either free sulphur or some of its compounds, applying it dry or in the form of a spray. Free sulphur is one of the best remedies against red spiders or mites. It is slower in its action than some compounds of sulphur, often taking several days to do its work, but it remains active for a long time, frequently two or three weeks, and usually kills the mites.

Sulphur can be applied dry and be driven into the citrus foliage or strawberry beds by means of a blower or duster. In the strawberry patch it can be applied by hand, or shaken into the vines thru a closely woven cloth or a perforated can.

Sulphur and Lime

It is better to mix three parts of dry sulphur with one part of hydrated lime. The lime can be bought or made by adding 32 pounds (4 gallons) of water to 100 pounds of quicklime. Mix the hydrated lime and sulphur thoroughly. Best results will be obtained by applying the dust at night or in the early morning when the plants are wet with dew, as dust seems to stick better then.

The dust is particularly effective on plants like strawberries where the leaves lie close to the ground. On plants like cotton, with leaves raised above the ground, it does not work as well. The heat from the soil is neces. sary to oxidize the sulphur.

Sulphur Spray

As a spray, use from 1 to 5 pounds in 50 gallons of water. It will spread and wet the plants much better, if 3 or 4 pounds of soap are added.

Of the sulphur compounds, lime-sulphur is about the best for use in the citrus grove. Use 1 gallon to 50 gallons of water. You can buy the commercial product or make one by using 8 pounds of lime and 8 pounds of sulphur. Cover the lime with 6 quarts of water and add the sulphur slowly as the mixture becomes heated. When the slaking is over, quickly cool the mass by pouring cold water into it.

Lime-sulphur does not work well on hairy plants and is not recommended for strawberries or other plants in bloom.

Potassium sulphide (livers of sulphur) makes an efficient and quick-acting spray. Use a pound and a half to 50 gallons of water.

None of these insecticides kill the mites' eggs, so it may be necessary to repeat the spraying or dusting a week later, if the sulphur has been washed off by heavy rain in the meantime.

Besides the cultivated plants named above, red spiders are quite likely to breed on wild blackberries, mustard, privet, wild geraniums, lambs' quarters, sow-thistle, evening-primrose, and other weeds. These should be destroyed when found near strawberry beds. One of the quickest ways to do this is to spray the plants with a solution of sodium arsenite, a pound to 10 gallons of water.

Gassing Bugs

By Frederic J. Haskin

That the airplane, together with some of the instructions for the use of poison gas and liquid flame, may be successfully used against insects which are man's worst enemies next to himself, seems to be indicated by experiments which have been conducted here and there.

The most successful experiment, and that upon which most of the high hopes seem to be based, was the spraying of a grove of ornamental trees in Ohio from an airplane, which completely destroyed the caterpillars infesting the trees at a single flight. The material used was calcium arsenate carried in a hopper below the plane. As the machine passed over the trees it heavily dusted with the poisonous material, a belt of land 600 feet wide. It is reported that 99 per cent of the caterpillars were killed and that the ground, after the attack, was literally covered with the dead.

Now the Department of Agriculture is at work on a plan for the use of the airplane in fighting its ancient enemy, the boll weevil. Millions have already been spent by the government in its fight on the weevil, and billions have been lost by reason of the fact that the boll weevil has not been destroyed. The boll weevil has for generations literally been eating the shirts off our backs and tires off our cars—for cotton, as much as rubber, is the basis of tire construction.

The Weevil Army

The problem of fighting the boll weevil seems to be in some respects much like that of checking an army. The boll weevil advances slowly along an immense front. The difficulty is to cover the whole front at one time, so as to check the advance effectively. Presumably, if the advance could be checked the enemy could be destroyed, but eradicating the weevil here and there does no permanent good if he is spreading in other places. Thus the government can not well put a large enough army in the field to check the weevil all along this advancing front at once by hand spraying. The individual planter does what he can, but what between price of cotton and cost of spraying he often lacks the funds to do the work. One planter may spend $15 an acre in intensive spraying and clean the boll weevil out of his farm. But his neighbor may be a poor tenant farmer who cannot afford to spend even the $6 an acre which is necessary if any crop is to be made at all. So the weevil checked at one place, advances at another.

The plan sketched out by the government calls for a series of airplane stations reaching clear across the cotton belt on the boll weevil front. When you realize that a single plane flying across this front might destroy the weevil completely over a swath 600 feet wide, and when you reflect how much time and how many men it would take to do the same work by hand you get some idea of the possibilities of the new method. But it has its difficulties, too. The spraying, to be effective, must be done at night, when the dew is on the plant, it seems. The Air Service, however, seems to be prepared and willing to undertake the work under these conditions.

Then, again, the expense will be heavy. Calcium arsenate costs about 10 cents a pound, and enormous quantities of it would be necessary for this lavish method of distribution. There is no doubt that the work would far more than pay for itself in the cotton it would save.

Here, as in so many other ways, through the clumsiness of modern industrial and government methods, it must be paid for by the taxpayer. But the taxpayer feels that he is already being taxed enough, chiefly to keep up the army and navy and pay the war debts, and if he has an ounce of sense he knows that the saving of this cotton is not at all sure to reduce the price of a cotton shirt to him. As for the planter, he wants the boll weevil exterminated badly enough in order that his whole living may not be eaten up by the pest, but its complete destruction does not mean any certainly increased income to him. In fact, a large cotton crop is apt to mean a low cotton price for the farmer, so that he really can not afford any extra large investment in this work.

How Science Is Blocked

These same obstacles, rooted in the stupid inefficiency of industrial organization and political government, are found blocking the path of numerous projects for the furtherance of man's control over nature. Science devises a solution of the problem, but industry and government seem designed to obstruct putting the solution into effect. The fact of the matter is that, while the physical sciences have advanced steadily since the Middle Ages, trade and government methods remain medieval in many respects. Our methods of regulating commerce, our diplomacy and our wars, for example, are all essentially medieval.

We stop to elaborate this importance idea, because this is a story about bugs. The point is that the airplane, if properly developed, may well give us control over any kind of insects which are now getting the best of us. Of course, the insects are slowly getting the best of us everywhere, and many scientists, especially entomologists, see life as a battle for supremacy between man and the insects. Insects devour our crops and forests and carry many of the deadliest diseases. The mosquito and the boll weevil, the Hessian-fly and the gypsy moth and a long list of other insect pests are man's most serious enemies.

The insects have the enormous advantage of being very small, very numerous and very prolific. We can not destroy them one by one as we do our other natural enemies. The insect problem was admirably posed by that friend of the human race, who some years ago, advertised a positive method of destroying potato bugs. He sent to inquirers, for one dollar, two small blocks of wood with instructions to put the potato bug on one block and hit him with the other.

What man must do, to save his crops and his life, is to invent means of destroying insects wholesale. Swat-the-fly campaigns are as ineffectual as the above potato-bug masher. On the other hand, mosquitos have been successfully destroyed by flooding their breeding-places with oil.

The air plane can undoubtedly destroy wholesale many kinds of insect pests, if science can only get in this instance the support it needs from government and industry.

More than ten thousand Florida farmers attended 215 field meetings held by county agents last year.

The man who isn't inspired to plant something in the spring of the year is practically immune to all varieties of work.

Nine chances out of ten spraying your fruit or vegetables will mean your success or failure. If you are not prepared to spray, don't believe that putting off helps the situation.

The Citrus Industry

ISSUED MONTHLY
By
ASSOCIATED PUBLICATIONS CORPORATION

Office of Publication, 411 Curry Building
TAMPA, FLORIDA
Los Angeles Mobile Ponce, Porto Rico

Address all communications to the Tampa Office

S. L. FRISBIE, Editor and Manager

TELEPHONE:
Editorial and Business Office 4819

Subscription $1.00 per year in advance

Entered as second-class matter February 16, 1920, at the postoffice at Tampa, Florida, under the act of March 3, 1879.

DIVERSIFICATION

A reader over on the East Coast writes to commend the stand of The Citrus Industry in the matter of diversified fruit growing. He believes that every citrus grower should devote a portion of his land to the production of other sub-tropical fruits. He writes in part as follows:

"I want to congratulate you on the efforts you are making to encourage citrus growers to produce other fruit crops. I own a grove in the Indian River section, and I look to citrus for my main money crop, but I do not confine my efforts to citrus alone. I am raising oranges, grapefruit and tangerines, but I also have small tracts devoted to pineapples, although pineapples are generally supposed to have run their course in this section. I also grow some figs, plums, peaches, grapes, Surinam cherries and other fruits. Recently I have planted a small grove of avocados, and I expect soon to supplement my plantings by putting in a number of mango trees and papayas. I have fruit of some kind growing on my own land every day in the year, and I find that my sales from other fruits come in mighty handy at seasons when citrus fruits are off the market. I firmly believe that every citrus grower should devote a portion of his land to other fruits, and I know from my own experience that this can be done with profit to the planter, besides supplying his own table with fresh fruits every day of the year."

This is just the point of view that The Citrus Industry has been trying to inculcate. While citrus fruits will always be the mainstay of South Florida horticulturists, other fruits of sub-tropical nature may be raised without in any manner interfering with citrus culture and to the great profit of the grower.

AN EXAMPLE OF TAX EXEMPTION

A probate court fight among the heirs of James J. Hill and Mrs. Hill has been on of late in St. Paul. The row has been over the appointment of an administrator for Mrs. Hill's estate of $12,000,000. But that is only incidental here. The significant point of public interest is that Louis W. Hill, former business advisor of Mrs. Hill, testified that beginning in 1916 and continuing until 1919, he disposed of heavily taxed securities held by his principal, substituting therefore tax free holdings, and in this way increased her annual income from $365,000 to $730,000 a year; that is he doubled net returns.

Here is a concrete example of the working of the tax exempt bond evil anybody can understand at a glance. In a single instance, in the case of a personal fortune which is surpassed by several in Michigan which have been similarly invested, a little shrewd readjustment has withdrawn $365,000 annually from the reach of the tax gatherers.

But the money thus lost to the public treasuries must be found somewhere, so the burden is shifted to business enterprise, to people who are obliged to work for their livings, to the widow with a cottage instead of a palace.

If the case of the estate of Mrs. Hill were an isolated one the matter would not be worth mentioning. But unfortunately it is typical of hundreds of other cases. A good many billions of dollars are tied up in tax exempt securities in this country. Figure very conservatively on the basis of what was done with the estate of Mrs. Hill by expert handling, and the extra weight of taxation placed in consequence on the shoulders of those whose property enjoys no exemptions becomes appalling. It runs into the hundreds of millions, possibly into the billions annually. It easily makes the difference between a situation in which the nation could handle its financial problems easily, and the present very difficult economic condition.

EFFECTIVE ADVERTISING

The Citrus Industry is in receipt of colored proofs of the advertising carried by the Florida Citrus Exchange in the pursuit of its national advertising campaign for Florida oranges and grapefruit.

This advertising is the work of the Thomas Advertising Service of Jacksonville, one of the greatest agencies of its kind in all the South and on a par with the greatest in the land. The advertising is in keeping with the Thomas standard of attractiveness and efficiency and has been a great factor in popularizing Florida citrus fruits of the Sealdsweet trademark.

The advertising is divided into several sections or classes, one section being carried in magazines of national circulation, another in fruit and trade journals of like circulation, still another in the great dailies of the North, and finally, a section devoted to Florida publications, in which the benefits of membership in the Exchange are stressed.

The colored advertisements appearing in the magazines of national circulation are prepared with especial care and attractiveness, and must command attention in whatever company they may appear.

The proofs submitted by the Thomas Advertising Service of Jacksonville and Tampa bring to mind as nothing else could do, the wide range being covered by the Exchange advertising and the wonderful effectiveness of the work produced by the Thomas Agency.

Florida fruit growers are diversifying their plantings as never before. This is a move in the right direction and one that will have a beneficial effect on the grower's bank account.

G. HAROLD POWELL, NOTED FRUITMAN, DEAD

The citrus industry of California and American agriculture in general has suffered a distinct loss in the death of George Harold Powell, general manager of the California Fruit Growers Exchange. Mr. Powell was stricken with heart failure while dining at the Hotel Maryland, Pasadena, on the evening of Saturday, February 18. He had been at his office during the forenoon and apparently had been in good health up to the time he suffered the fatal attack.

G. Harold Powell had just rounded out a half century of life. He was born in Ghent, N. Y., February 8, 1782. His father, George T. Powell, a well known New York apple grower, and mother, Marcia R. Chace Powell, survive him, and have been spending the winter with their son in South Pasadena.

In 1891 G. Harold Powell graduated from the Chatham, N. Y., high school and entered Cornell university, taking the agricultural course and working under L. H. Bailey. From Cornell he was graduated with bachelor of science degree, but later returned to the university and in 1896 he secured a fellowship and a master's degree. That same year he married Miss Gertrude E. Clark, who with three sons, survive him. Shortly after, he undertook the duties of horticulturist and entomologist at the Deleware Experiment station. After five years of service there his work attracted the attention of the U. S. department of agriculture and he was detailed to and undertook the solution of decay and other problems of the apple industry. Most of these troubles Mr. Powell found to be due to improper methods of handling and harvesting. Then having made a success of this investigation he was sent to Georgia for a time to aid the peach grower in salving his problem—that of getting his fruit into the market in merchantable condition. Pre-cooling was suggested there.

In 1904 Mr. Powell was sent to California to aid the citrus fruit grower. Blue mold and other diseases were causing much loss in fruit which was shipped. He solved this difficulty by simply applying the scientific knowledge already in hand to practical use. He went into the orchard in his investigations and as a result of his work demonstrated that most of the decay was due to outward mechanical injury either by finger nail, clipper cut, or careless handling which permitted the fungi to get inside the fruit.

In pursuing this work Mr. Powell went to Italy and subsequently back to Washington where he was made assistant chief of the bureau of plant industry. In 1911 he returned to California and was made manager of the Citrus Protective League. After another trip abroad to study European conditions and practices, Mr. Powell returned and was made general manager of the California Fruit Growers Exchange, the position which he held with such signal success up to the time of his death.

From all sections of the citrus belt in Florida, save only from some parts of the storm damaged area, comes the report of an abundant and apparently thrifty bloom. Trees have come through the winter in excellent condition, have put forth a fine early spring growth, and give promise of a satisfactory harvest if proper attention to fertilization and spraying is given by the grower.

FARM BUREAU AND COUNTY AGENT

There is perhaps no phase of farming which requires so much skill and knowledge and pampering as does fruit growing. Marked improvements have been noted in orchards where county agents have demonstrated the use of fertilizers and methods of pruning, grafting and budding. Many orchards have been saved from destruction by disease and pests by the advice of the county agent in the use of sprays. And where the farm adviser is not a horticultural specialist, he has a contact with the experiment stations and with the state college of agriculture and can bring expert help to any farmer. If it were not for the support of the Farm Bureau, the county agent could not function efficiently.

The old style "tin" packing house, so common a sight in Florida a few years ago, is fast giving way to the modern steel and concrete structures of latest design and arrangement. There are many such packing houses now in Florida, and one of the most perfect in equipment and arrangement is that of Theodore Strawn at DeLeon Springs, an interior view and description of which is given elsewhere in this number. It has been said that this house is the last word in packing house arrangement and equipment. Certainly it is a model which might well serve as a pattern for other builders.

Secretary B. F. Floyd of the Florida State Horicultural Society, informs us that the work of arranging the program for the forthcoming meeting at Lakeland on May 2-5 is going forward apace. Already the committeees have been named and it is anticipated that the announcement of the complete program will be made at an early date.

Spraying operations have begun in many groves, and there are many indications that such operations will be carried on more extensively, more systematically and more intelligently this season than ever before, to the end that there may be a higher percentage of fancy and a lower percentage of russets in next winter's marketing.

Florida nurserymen who added avocados to their listings of stock last season have been richly rewarded by a heavy demand for trees during the winter planting season. Greatly increased plantings, both in nurseries and in groves, is the present outlook for the coming year.

Storm damaged citrus groves will need a severe application of the pruning knife. The question of when this pruning shall be done is the only problem to be solved by the grower. The necessity for the operation is already clearly established.

It is not too late to complete your grove plantings—but you must hurry.

Spray Schedule for Peaches

By J .R. Watson and O. F. Burger

No.	Enemy	Materials	Time of Application	Remarks
1	San Jose Scale.	Commercial lime-Sulphur, 1 to 8.	When trees are dormant—Dec. or Jan.	Must not be used after the buds have started.
2	Curculio and gouger.	Lead arsenate, 1 pound to 50 gallons, plus 5 pounds of lime.	Just after petals have fallen.	Use good rock lime and slack before using.
3	Curculio and gouger.	Repeat No. 2.	Ten days later.	
4	Brown rot, scab, curculio and gouger.	Self-boiled lime-sulphur, 8-8-50, plus 1 pound of lead arsenate.	Two weeks after No. 3.	If curculio is not present, omit the lead arsenate.
5	Brown rot.	Self-boiled lime-sulphur, 8-8-50.	About 4 weeks before fruit ripens.	If curculio is present and lead arsenate was not used in No. 4, it may be added here.

Explanations

No. 1. Commercial lime-sulphur is made by boiling together lime and sulphur. To make a standard, uniform product, one needs more apparatus than is found on most farms. We advise most farmers to buy the commercial product for this first spray. At the strength recommended it can be used only on dormant trees. In South Florida this means that this spray must not be used after December. Trees are dormant for so short a period that the growers must act quickly. In North and West Florida it can usually be applied in January. If a few of the old leaves are burned, no harm will result, but the young opening buds must not be sprayed.

No. 2. The lime must be good, fresh, rock lime and not air-slacked. It should be slacked in a little water and strained before adding to spray tanks. If paste lead arsenate is used instead of the powder, use 2 pounds.

No. 4. Self-boiled lime-sulphur is made by pouring sufficient warm water to slack it over 8 pounds of good quick rock lime. While the mixture is boiling, gradually add 8 pounds of flowers of sulphur, stirring at the same time with a hoe. Watch the mixture so that it does not become dry. When boiling ceases, cool quickly by adding enough water to make 50 gallons. Then add 1 pound of lead arsenate powder or 2 pounds of paste. Do not use the lead arsenate unless curculios or their signs are present, as too frequent spraying with lead arsenate is injurious to trees.

No. 5. Lead arsenate can be used, if it was not used in No. 4. Do not spray with lead arsenate more than three times in a season.

If peaches are to be shipped to a distant market, they should be cooled immediately after picking and placed in an iced car to avoid decay in transit.

Good Roads Essay Contest

$4,000.00 Scholarship and Many State Prizes to be Given High School Students

The Florida high school student who will write the best essay on "How Good Roads are Developing My Community" will have a chance to win a $4,000.00 national prize and one of the state prizes in a contest just announced by the General Extension Division of the University of Florida.

The national prize is a $4000.00 scholarship, good at any American University and given by Mr. Harvey S. Firestone through the Highway and Highway Transport Education Committee, of which Hon. Jonh J. Tigert, Commissioner of Education, is Chairman.

The General Extension Division, in cooperating with the committee, will offer the several state prizes for the best essay written by Florida high school boys and girls who enter the contest. Principals of high schools will be asked to urge as many high school students as possible to write essays on this subject. From the total number, each local principal will select the three best essays written by his students. These essays will be forwarded to the General Extension Division and entered in the state contest. In the state contest the essays will be considered individually in competition with every other essay entered for first, second, and third place. Students winning these places in the state contest will be awarded medals given by the General Extension Division. The essay winning first place in the state contest will be entered in the national contest in competition with essays from other states for the national scholarship prize.

In addition to the contest among individual students in the state, the high school whose three essays entered in the state contest are judged to be the three best entered by any one school, will be awarded first place among the high schools of Florida, and will be given a trophy cup by the General Extension Division.

The prizes offered to the individual students and the individual high school in the state contest are to be given entirely independent of the outcome of the national contest.

In speaking of the contest Ruth Riley of the General Extension Division said, "Last year Miss Garland Johnson of Bridgeport, West Virginia, won the national prize. Certainly whatever a West Virginia high school girl can do, any Florida boy or girl can attempt to do just a little better. Florida high school boys and girls have won an enviable reputation in athletics and it is believed that they can do the same in this contest."

The following comment on the contest appeared in Collier's Weekly for March 4th: "Again a great prize is offered by Highway and Highway Transport Education Committee. This year, as last year, Collier's is glad to tell you about this contest. Boys and girls who carefully consider the prescribed title, and then write clear, informative essays based on their own observation and study, will profit by their work. Such study is useful to anyone.

"The final winner—the boy or girl whose essay stands out clearly above the essays of hundreds of others who will compete—will earn one of the best prizes life can offer."

All communications concerning the contest should be addressed to the General Extension Division, Gainesville, Florida.

Where the cow is, there is Arcadia; so far as her influence prevails, there is contentment, humility and sweet homely life.—John Burroughs.

Florida's county agents traveled more than a quarter of a million miles last year in the interest of their work.

Spraying to Control Melanose

By O. F. Burger and E. F. DeBusk

Melanose russet can be distinguished from rust-mite russet by its raised appearance and sandpaper-like feel to the touch. If one rubs his hand over a russet fruit and it is smooth to the touch, this is rust-mite russet. However, if the russet is scabby and rough, resembling sandpaper, this is melanose.

Time to Spray

The damage done by the fungus which causes melanose is when the leaves, twigs and fruit are young. If one waits to spray until he sees melanose on his fruit, the damage is already done and his spraying will do no good in controlling the disease.

The leaves and twigs can be infected only while they are very young. After the leaves are from three to five weeks old they cannot be infected with this disease. Hence, the time to spray is when the leaves are young. The spray makes a coating over the fruit and leaves so that the fungus cannot infect them. Experiments conducted last season showed that, if the trees are sprayed from 10 to 20 days after two-thirds of the blooms have dropped, leaves, twigs and fruit will be protected from this disease.

What Spray To Use

Bordeaux-oil spray has been used for experimental purposes and has given good results. The following formula was used: Bluestone 3 pounds, rock lime 3 pounds (use only a good grade), water 50 gallons, and some good oil emulsion 3 quarts.

Mix the above ingredients in the following manner: Slake 50 pounds of rock lime in a barrel and add enough water to make 50 gallons of the solution. Hence, one gallon will contain one pound of lime. Suspend a sack containing 50 pounds of bluestone into the top of a barrel of water. After the bluestone has dissolved, take out the sack and add enough water to make 50 gallons of this second solution. Hence, one gallon of bluestone solution will contain one pound of bluestone.

Now take 3 gallons of the lime solution, pour it into a third barrel and add 22 gallons of water. Take 3 gallons of bluestone solution, pour it into a fourth barrel and add 22 gallons of water. Pour thru a strainer, the contents of the third and four barrels into the spray tank, at the same time stirring the two mixtures. After these solutions are well-mixed and while the agitator is still going, add 3 quarts of an oil emulsion. Always mix the solution in the above proportions regardless of the size of the spray tank. The solutions, when mixed in the tank, should be used the same day. The lime and bluestone solutions, kept separate in the barrels, will keep thru the spraying season.

How to Apply the Spray

A power sprayer must be used and the pressure should not fall below 200 pounds. If the spray gun is used, the pressure should not fall below 250 pounds. To do good and thoro work, the use of spray rods is recommended.

Cause of Melanose

Melanose on citrus fruits is caused by a fungus which lives in the dead branches and terminal twigs of the trees. During rainy seasons and heavy fogs the spores, or seed-like bodies of the fungus, are washed from the dead twigs onto the young leaves and fruit. These small seed-like bodies cause the melanose.

This is a preliminary report on melanose control. Experiments are being carried out to determine the best methods of controlling melanose by spraying with bordeaux oil.

This solution will kill friendly fungi as well as the harmful ones. Friendly fungi assist in keeping scale and whitefly in check. Therefore, it is advisable to watch the grove and spray for scale, if the scale insects are increasing in number. It is recommended that spraying for scale be done in May when the young are in the crawler stage.

WITHERTIP AND DIE-BACK—CAUSE AND CURE

By Alvin Fox

The withertip attacks trees of all ages. The fungus enters the tissues of the leaves and grows down into the fruiting twig, cutting off much of the younger growth and lessening the bloom. Withertip injury is often mistaken for DIE-BACK, but may be distinguished from die-back by the absence of multiple buds, gum pockets and dark excresences.

Withertip russeting or tear-streaking can nearly always be traced to a dead branch or twig overhanging the fruit. The fungus lives in the dead wood, rain or dew collects in drops, where the drops fall they carry with them numerous fungus spores, which germinate on the fruit, causing the russetting or tear-streaking.

Tear-streaking may occur any time after the fruit has begun to color, and on late varieties while the fruit is still green. Pruning out all dead and affected wood and spraying with a good fungicide are the most approved control measures. The best time to prune is during January.

Die-Back—the symptoms are: First, the waxy lustrous foliage; second, the formation of gum pockets or swelling of the bark near the eyes at the union of the leaf with the branches; third, stained terminal branches, reddish brown in color. Other symptoms are multiple buds "S" shaped twigs, ammoniated fruit. The presence of gum pockets and multiple buds is conclusive proof the "DIE-BACK" is present. Dieback is the most widely distributed of all citrus diseases; it will attack all varieties and in all localities. The cause generally assigned are poorly aerated or sour soil, or unsuitable fertilizer.

The use of green manure or stable manure, unless well rotted, is believed to cause die-back. I have also advanced the view that an excess of fertilizer, by stimulating the trees unduly, develops weaknesses which result in die-back. When the condition appears, the grove owner should have an expert to examine his groves and follow the advice he will offer as to soil treatment. Where dieback is present, trees are often too weakened to withstand insect attacks, and protective spraying becomes absolutely necessary.

NOTE—Break up your bluestone into small pieces the size of a pea; spread around your trees affected with the diesase, and work well into the soil, is one of the best remedies. The amount of bluestone used for a tree depends on the age and the general conditions, etc.

SILVER CUP FOR HIGH QUALITY FRUIT

The following is from the Orlando Reporter-Star:

The American Fruit Growers, Inc. had an exhibit at the Sub-Tropical Mid-Winter fair that was very attractive, and was awarded a silver cup by the committee of judges for the excellency of quality. This organization has been striving after excellency in quality and this reward for earnest effort that will be appreciated by the members of that organization, and growers who take a pride in fruit selection and grading that pleases the public.

Farmers are becoming aware of the fact that putting farming on a sound business basis is up to them, and that by organization they can reduce cost of production.—Secretary Wallace.

The Spraying of Citrus Trees

A. C. Nichols, Clearwater

This title might lead you to think that I was going to tell you all about this subject. But actually all I have planned is to tell you how I handle the subject on my own grove, with no intention of offering advice to these experienced growers.

When I first began to spray, and this was when I first owned a grove, I started out with one of these man-power lever 2-plunger pumps rigged up to a 50 gallon barrel and as an absolute novice, since I had never even seen any spraying done. The only reason I can see now for success with such inexperience and inadequate outfit was the surprise on the part of the insects on these heretofore unsprayed trees. I call this outfit inadequate for, while it would handle two nozzles, it was only at a pressure of 80 to 100 pounds, and because of its inability to get over any job at all sizeable and get it done quickly. My only excuse for its use was lack of cash to get anything more expensive. My next effort was to hire power machines. This proved generally unsatisfactory because there were few machines available, they were difficult to get just when wanted and often the work of the operators did not suit me. Then I got a used machine myself but it was of small capacity and I finally graduated some two years ago to a new large machine having a triplex pump capable of handling four nozzles or two guns at 250 pounds pressure. Since then we have been able to get out and get a job done with certainty and dispatch.

But no matter what machine a man uses, I believe one of the most potent factors for results from spraying is in thorough work. I have seen a mist drifted around and through a tree which was called spraying. I think a better term for it would be a waste of money, for such work can not be expected to produce results. In my own grove, though we try to spray thoroughly, I have seen where some bunches of oranges were missed by an operator in a lime-sulphur spraying for rust, and this fruit continue to rust right on in spite of the known killing power of the fumes as well as contact. Then what effective control can be expected of careless spraying, say with the emulsions, where only actual contact kills? In our own grove we first get inside of the trees and thoroughly spray there, then take the outside beginning on the side away from the machine and, if using rods, thoroughly working the nozzles in and out amongst the foliage. We generally go back inside the tree a second time on the opposite side in order to thoroughly cover. We normally spray under 225 pounds pressure. For each spraying, I take it slow and send the men back repeatedly to see for themselves whether or not they are actually getting the under sides of all leaves. As to whether we use rods or guns depends upon the trees and what we are spraying for. We always use guns on seedlings and always for lime-sulphur sprayings on all trees but for the oil sprayings on budded trees I believe rods with angle nozzles give us more thorough results. On rust sprayings we are not quite so careful when covering the insides of the trees, but for our spring 1 to 40 lime-sulphur application on grapefruit we try to be as thorough inside as out, for only in this way can we get the fruit covered when the new growth hides and shields so much of the new fruit from outside work. As to the amount of liquid used I believe we cover a trifle more ground with guns when trying to do equally thorough work.

Now as to when to spray, we have the spray schedule admirably worked out for us by the several men and agencies that are helping us growers in the State. If completely followed, I have no doubt it will accomplish its purpose, that of giving us high-grade fruit, and more of it, from clean trees. But, for my part, while I follow the schedule in a general way, I try to exercise some judgment in its application to my own grove just as I suppose the rest of you do. For instance, I very seldom make any spraying in the bloom but follow it immediately with a lime-sulphur application, on both oranges and grapefruit. On grapefruit I use lime-sulphur solution 1 to 40 irrespective of weather conditions or whether I have noted any scab on young growth. I do this because this preceding by only two or three weeks a spraying that would be necessary for red spider or rust mites or both, makes that unnecessary and the extra two gallons of lime-sulphur per tank is used as insurance against scab, should scab weather develop. (1).

The application of lime-sulphur solution on oranges at this time is 1 to 66. As to the reasons for making this application at this time instead of waiting until there are spiders or mites to justify it, can only say I would rather do it when convenient than to drop everything else as a matter of necessity; that I would prefer to have no indication of spider at all; and as I believe lime-sulphur solution aids early maturity of fruit, I like to begin as early as possible. I also think it acts as a tree tonic and hence if applied at this time may cause a bit more fruit to stick. This one lime-sulphur spraying, thoroughly done, holds down rust generally until the first part of July and in only one season that I can remember has any further spraying for rust mites been necessary. I have tried to reconcile the statements I have heard at times that for effective rust mite control a spraying is necessary every six weeks with my own experience that two sprayings are ample, and the only answer I have been able to reach is that perhaps we spray more thoroughly when we do spray than do others who spray oftener.

(2) I invariably make the oil spraying in the fall, although if feasible I like to wait until the fruit it picked. Of course, if the fruit is badly sooted an earlier spraying is necessary. The spring application depends upon my need. I have been at outs with the spring application, especially on grapefruit, because I have generally gotten oil spotting or shadowing of the fruit and sometimes permanent injury in the form of burns. I have tried different insecticides but with no different results in this respect. Often, when just the right times comes to spray for white-fly, the fruit is pretty small, and these considerations have led me to omit the May spraying unless fly or scale is prevalent enough to make its application imperative. This past year, however, the use of a very weak Bordeaux in the oil spray, and in hard water, that is, at the rate of not over one-half pound of blue-stone and lime each, to fifty gallons of water enabled me to make this spraying without producing so much as one oil spot on the fruit that I could discover. And I am perfectly satisfied that the result was due to the addition of the Bordeaux, for in a neighbor's grove where our equipment was used, the same oil emulsion in soft water but without the Bordeaux produced very considerable of shadowing.

Now sometimes things come up that are not mentioned in the sched-

ule. For instance, some three years ago I had a very bad infestation of Mealy Bug on grapefruit. Wishing to do something, but not knowing what, I sprayed experimentally with lime-sulphur and Black Leaf 40, lime-sulphur and nicoticide, whale oil soap and nicoticide and with a proprietary insecticide. While all of these combinations appeared to have some effect on the old bugs, shortly afterwards there were great numbers of crawlers so that I was satisfied that my spraying had been effective. Yet in three to four weeks, all of this infestation appeared to be dead. But I never gave spraying any credit for it and learned later that doubtless fungi that attack the Mealy Bug had overtaken and conquered the bugs at last.

Again, when experimenting last year with the Bordeaux-oil combination spray, I sprayed two rows through the seedling grove with it. The seedlings had shown serious ammoniation on the previous crop and in the fall of 1919 I had dosed the trees with twenty pounds of ashes and three pounds of Bluestone each. On the 1920 crop a little ammoniation showed up in July, a little of the young fruit spit and fell off and that was the end of it. But on the two rows sprayed with the Bordeaux-oil, although through one of the worst ammoniated section, no ammoniation showed up whatever at any time. A similar result was obtained on a few pineapple trees where the fruit had previously persistently shown some little ammoniation in spite of applications of bluestone and of ashes.

While mentioning this as one very definite and favorable result from the use of this combination spray, my principal use of it was on grapefruit. Here I did not obtain the results I had hoped for and I have been rather hesitant about discussing them here. But I realize that the trouble might just as easily have been with myself as operator, and probably was, as with the material. And I decided that if you will understand that what I say is not at all intended as any criticism of the spray but simply for discussion, I would tell you what I did. It was used first as a clean-up spray on a block of trees six years of age, before the spring growth came out and also on a few rows in the larger grove. We had a very long blooming season last year and my follow-up spray with lime-sulphur solution 1 to 40 was not put on until April when finally all the bloom had shed. Up until April comparatively little scab infection was noted but just shortly after the April spraying there seemed to be considerable infection on the fruit. There seemed to be no difference, however, where the Bordeaux-oil had been used previously. Later, in June, I saw a few indications of Melanose and it occurred to me that this spray might protect the most of the crop from infection during the summer rains. So I put it on all grapefruit excepting about fifteen trees. This one spraying, but on some parts two if the clean-up spray is counted, did not prevent Melanose (perhaps I should have used more or infection may already have taken place), and the fruit on the unsprayed fifteen trees was certainly just as good as that on the other trees. So, because of the lack of results as I used it, the heavy dose of scale that followed on these trees, and of its cost, of which I will speak in a moment, I am not, at present at least, in favor of its further use on my grove.

As to cost, I figure the Bordeaux-oil spray cost me about one and three-fourts cents for material and one cent for application for each gallon of spray used. It took on an average ten gallons per tree or a cost for a single spraying of twenty-seven cents per tree. As these trees picked on an average just under six boxes to the tree —they had just a good average crop— it gives a cost per box of four and one-half cents. It seems to me that if many sprayings are necessary for results that my need would have to be very serious—much more so than it has ever been yet—to justify the expense. They would practically be entirely additional to the regular four sprayings and which I figure, at present prices, at about twelve to fourteen cents per box total. I might add that, except for some Melanose, these normal four sprayings give me reasonably clean trees and crops of bright desirable fruit.

Another thing I might speak of in this connection, although it has no relation to the efficiency of the material. The Bordeaux-oil was used in June and of course in July I had to use lime-sulphur for rust. The combination of these two sprays produced a brilliant reddish brown spotting on leaves and fruit. This gradually weathered to a black and persisted on the fruit until picking. I had to explain to every prospective buyer what it was and show how easily it rubbed off, for it made the fruit appear as though it needed explanation or apology. Actually too, in the early stages of coloring, these spots hindered the coloring of the skin directly beneath so that when rubbed off the skin showed a mottled green and yellow.

---

(1) Sometimes, by making only this one spraying, I do get some scab showing up on the young fruit, but it does not seem to develop and the fruit out grows it. Of course, if serious scab infection should begin to show upon new growth, I should probably get out and spray in the bloom.
(2) Soluble sulphur I seldom use unless I happen to need a sulphur spray at the same time as an oil spray and this does not prove often. In my own experience it does not begin to be as effective in the control of rust mites as is lime-sulphur solution.

HUMUS AND NITROGEN NEEDED BY FLORIDA SOILS

The greatest needs of Florida soils are humus and nitrogen.

How may our Florida soils receive these things?

The humus may be supplied without at the same time supplying considerable amounts of nitrogen. The nitrogen may be supplied without at the same time supplying considerable humus. But there is a way by which both may be supplied at the same time. How?

Grow legumes and plow them under preferably after the crop having been used as feed by livestock.

As winter draws to a close and spring approaches the man of the soil begins to think in terms of crops and fields. Specialists of the College of Agriculture, University of Florida, call attention of these farmers to the fact that now is the time to plan to provide those two lacking things, humus and nitrogen.

No Florida farmer should plan his year's crops without including crops that will furnish humus and nitrogen. Be sure to grow peanuts and velvet beans and cowpeas. There are other plants which manufacture nitrogen from the air and store it in the soil, but these just mentioned are the principal ones grown in this section. They are known as legumes and are exceptionally good friends of the farmer saving him much money on his fertilizer bills providing he plants and grows them on his land.

Write to the College of Agriculture, Gainesville, and ask for a copy of Extension Bulletin No. 31. It will tell you how to raise pigs, being especially prepared for the club boy and girl.

County agents in Florida held 863 farm meetings in 1921 and gave 1147 talks on agricultural subjects at different gatherings of farm people.

Gratitude is the most inexpensive commodity of which the world never had an over-supply.

Report of State Chemist

The relation of the work of the state chemist to the citrus industry of Florida is so clase, and the citrus grower is so dependent in many ways upon the proper functioning of this department, that every citrus grower feels, or should feel, an active interest in the work of the department. For this reason the following brief summary of the state chemist's report for the year 1921, is submitted:

State Chemist's Report 1921

Tallahassee, Fla., Jan. 1, 1922.

To His Excellency,
Cary A. Hardee, Governor,
Tallahassee, Florida.

Sir:—I have the honor to submit the following report of the Chemical Division of the Agricultural Department of the State of Florida, for the year ending December 31, 1921.

The report of the State Treasurer shows the sale of inspection stamps covering 291,618.32 tons of commercial fertilizers and cotton seed meal—Amounting to ---------- $ 72.904.58
And 166,388.72 tons of Commercial Feeding Stuffs—amounting to ---------- 41,595.73

A total revenue of ---------- $114,500.51 paid into the treasury to the credit of the General Revenue Fund; from which is to be deducted the total expenses of the Chemical Division incident to the execution of the fertilizer, feed stuff, pure food and drug, immature citrus fruit and gasoline laws. The total expenses of the chemical division, as audited and approved by the state chemist and approved by the commissioner of agriculture, in accordance with the opinions of the attorney general of December 7, 1917, August 1, 1919, and October 3, 1919, being $25.291.08 showing a balance of $89,209.43 paid into the general revenue fund of the state. A summary of these expenses will be found on the succeeding page. A detailed financial report will be found in the last pages of this report. For expenditures of the funds charged to the State Chemist, and paid upon the approval of the Commissioner of Agriculture only, I would respectfully refer to the Report of the Commissioner of Agriculture.

Summary of Expenditures

Salary of the State Chemist ----------	$ 3,000.00
Salary of Assistant State Chemist, Fertilizers ---	2,000.00
Salary of Assistant State Chemist, Foods and Drugs ----------	2,000.00
Salary of Assistant State Chemist, Stock Feed ---	2,000.00
Salary of Assistant State Chemist, Oils (6 months)	1,000.00
Salary of three Food and Drug Inspectors -------	5,400.00
Salary of Clerk Chemical Division ----------	1,200.00
Salary Janitor ----------	540.00
Samples and incidentals, Pure Food Dept. -------	1,190.28
Chemical, apparatus and incidentals, State Lab.--	560.68
Traveling expenses State Chemist and Assistants	747.00
Postage, State Chemist--	122.94
Citrus fruit inspection, apratus, etc. ----------	111.69
Total, audited and approved by State Chemist and Commissioner of Agriculture ----------	$ 19,872.59

Items Approved by Commissioner of Agriculture

Traveling expenses Food and Drug Inspectors----	$ 3,487.38
Salaries and expenses, Citrust Inspectors --------	1,931.11
Total, approved by Commissioner of Agriculture ----------	$ 5.418.49
Total expenses, Chemical Division ----------	25,391.08
To credit General Revenue ----------	89,209.43
Gross Revenue ---------	$114,500.51
Appropriation, 1921 ------	$ 25.865.00
Expenses Chemical Division ----------	25,291.08
Unexpended appropriation ----------	$ 573.92

Respectfully submitted,
R. E. ROSE,
State Chemist.

Summary of Analytical Report, 1921

The following analyses were made during the year:

Official sample fertilizers-----	151
Special samples fertilizers (sent in by citizens) ----------	246
Official samples feed stuff------	258
Special samples feed stuff (sent in by citizens ----------	18
Official Food and Drug Samples	266
Special food and drug samples (sent in by citizens) ---------	61
Official samples citrus fruit----	103
Special samples citrus fruit----	233
Gasoline ----------	926
Kerosene ----------	294
Samples, collaborative --------	27
Miscellaneous samples (sent in by citizens) ----------	78
Total number analyses ------	2,661

Special Sample Drawn by Purchasers

The Florida law is peculiar in this respect, permitting citizens, purchasers of lawful feeds and fertilizers that are duly registered, under oath with the Commissioners of Agriculture as evidenced by the guarantee tag and stamp upon each package, to draw samples of the same, according to law, rules and regulations, to prevent the submission of spurious samples, and obtain, without cost, a certificate of analysis by the State Chemist. In case of deficiency in the goods so purchased, the sample being properly drawn, packed and transmitted, according to law and regulations, the purchaser can, upon proof of the fact, obtain a judgment for double the amount of the price of the goods, while the dealer will be subject to the penalties of the law. This provision of the law, however, does not apply to illegtimate goods sold by unregistered, unlawful dealers or their agents; consumers who purchase such unlawful goods having no recourse under the law, for damages.

PRUNING YOUNG CITRUS TREES

Start your young trees right and do not let your pruning be such as to stunt their growth, says E. F. DeBusk, county agent of Lake County. In pruning young citrus trees it is good practice to allow all vigorous growth that comes ou above the union of the bud and stock to grow for one season after the tree is transplanted to the grove.

The leaves are the factories in which material from the soil is converted into plant tissue. There is no time in the life of the tree when these little factories are more important than the first year after leaving the nursery row. Therefore, to get maximum growth it is necessary for the tree to have sufficient leaf capacity to utilize all raw plant food available to the roots.

In order to insure having leaves, cut back the young tree to about 16 to 20 inches when transplanting. A longer trunk is liable to become dried out and hardened and, thus, make impossible the formation of leaves. But, if the trunk is short, there is little danger of its becoming dried out; the little buds will swell and form leaves, the sap will rise and the tree will get a good start.

As an extra precaution to prevent red rot of sugar cane burn all old cane leaves and stalks left in the bed.

Some Results of Citrus Fruit Inspection

By A. M. Henry, B. S.

Along with the inspection of citrus fruit under the regulatory provisions of the food laws during the past ten years some investigations into the ripening of oranges and grapefruit have been made. Some 2500 samples of oranges and grapefruit have been examined to determine the ratio of solids to acid and further investigations have been made on 500 of these samples. Consequently considerable data has been collected in regard to the maturing of citrus fruit.

These investigations have shown that the chief causes of variations in the maturing and coloring of grapefruit and oranges are location, climate, variety, and culture.

The variations from location are caused by differences in the composition, drainage, and topography of the soil in different places. The composition of the soil seems to have different effects on the maturing and coloring of fruit. Some soils seem to hasten the maturing and retard the coloring of fruit; while other soils have the opposite effect. These variations resulting from location and soil seem to affect grapefruit more than oranges as there are certain sections that lead in the production of early grapefruit year after year. Location also affects the climate as the amount and time of rain and heat are different in the various sections of the state.

Variations from year to year in the maturing and coloring of citrus fruit from climatic causes are principally affected by differences in the time and amount of rain, heat, and cold. This effect of the seasons, the earliness or lateness of the maturing and coloring of citrus fruit is the most pronounced and noticeable of all the variations, particularly with oranges. The orange crop in the fall of 1921 has been the earliest crop since the inspection of citrus fruit has been carried on, although even then there were some sections later than usual.

These investigations have not been extensive enough with the different varieties and strains of oranges and grapefruit to draw any conclusions as to their effects on the maturing and coloring of oranges and grapefruit.

Cultural conditions, differences in cultivating, fertilizing, pruning, and spraying of the grove, appear to have more influence on the quality of the fruit and the time of coloring than other conditions. Fruit that is grown in groves given good cultivation, proper fertilization, efficient pruning and spraying will produce fruit that is mature and edible earlier in the season than fruit from neglected groves, although the fruit from the well cared for grove will not color as early as the fruit from the neglected grove. These observations have been so universal in the State that the fact that thrifty groves produce early maturing and late coloring fruit should be emphasized. If one wishes to produe early colored fruit with fine, large seeds and a poor quality of flesh, sour and bitter; observation has shown that the best way to do so is not to take any care of the trees, neglect them, and allow insects and diseases to injure them.

In conclusion observation and experience during ten years of citrus fruit inspection have shown that the coloring and maturing of citrus fruit are affected differently by such factors as location, climate, variety and culture. The factors that are most likely to cause thrifty, healthy groves and early maturing fruit are also the factors that will tend to keep the fruit green in color. The factors that tend to stunt the trees and retard the development of the fruit are the factors that cause early coloring of the fruit. For lack of time and money the Chemical Department of the State has not been able to devote the attention to this very vital subject which it deserves. The work we have accomplished in conjunction with the regulatory work in the enforcement of the law has shown the necessity for further and more intensive work.

Relation of Color to Maturity

"During the inspection season, Sept. 1, to Nov. 5.:

68 samples of grapefruit, less than half colored showed:

20 samples, or 29%, mature.

48 samples, or 71%, immature.

238 samples of grapefruit, one-half colored or more, showed:

126 samples, or 53%, mature.

112 samples, or 47%, immature.

65 samples of oranges, less than half colored, showed:

9 samples, or 75%, mature.

16 samples, or 25%, immature.

72 samples of oranges, one-half col. ored or more, showed:

32 samples, or 74%, mature.

19 samples, or 26%, immature.

These samples were taken from the various packing houses where the fruit was being shipped or being prepared for shipment.

"The record further shows that of nine samples of fully colored grapefruit, only three were mature, while the other six—two-thirds of the fully colored grapefruit—were immature; that grapefruit showing even less than one-quarter color were fully mature; and that mature and immature oranges both showed color from a trace to three-quarters color.

This study emphasizes the fact that color bears no relation to maturity.

THRIP IN CITRUS BLOOMS

Citrus trees will soon be in full bloom, if not already, over the entire citrus section of the state. Now is the time to combat one of the pests of oranges and other related fruits, says Professor J. R. Watson, entomologist of the Florida Experiment Station.

If there are many thrips on and about the blooms, spray them now with the following solution

Commercial lime-sulphur solution (32 degrees Baume)------3 qts
Black leaf 40 --------- ------½ pt
Water ---------- 50 Gals.

In applying, drive the spray straight into the blooms with considerable force. It should be applied just as the trees are at their height of bloom.

Some growers are spraying at this season for scab on grapefruit. If they will add tobacco extract (Black leaf 40) to the solution for scab, they will kill the thrips and thus do two things at once.

Thrips are small yellowish-brown insects about a twenty-fifth of an inch in length. They feed on the petals and other tender parts of the flower, which causes much of the bloom to drop without setting fruit. Eggs are laid in the tender stem at the base of the fruit and the young thrips, which hatch out from these eggs in three or four days, feed upon the developing fruit and cause smooth, irregular-shaped, sunken spots in the skin. These spots mar the appearance of the fruit and lower its grade.

Controlling the Mealy Bug

By J. R. Watson

The mealy bug, a common pest in citrus groves, especially in dry warm weather, can be controlled satisfactorily by spraying with a good insecticide.

Merely washing these insects off the trees is so effective that spraying with clear water is often sufficient to control them. However, it is better to use an insecticide. Use one of the miscible oils commonly used for whitefly, or whale-oil soap, 1 pound to 4 or 6 gallons of water (according to whether the water is soft or hard). In spraying it is important to have good pressure in order to force the liquid into corners and crevices and to wash many of the insects from their support.

Kerosene emulsion is fairly effective. To make this dissolve 1½ pounds of soap in 3 gallons of hot water, add 3 gallons of kerosene and mix by means of a pump; then add this to water until there are 50 gallons.

The female mealy bug lays from 250 to 400 eggs in the cottony mass she secrets. In summer the eggs hatch in eight to ten days. The insects move about more or less, but seldom migrate far. They congregate in protected places, as the bases of leaf-stalks, the stems of fruit or tree forks. A favorite place is between touching oranges or grapefruit. These bugs require about six weeks to grow to full size.

Mealy bugs increase most rapidly during dry weather. For this reason they are most abundant in spring and early summer. As summer rains come on they disappear, sometimes quite abruptly. It has recently been shown that this sudden disappearance is due to a fungus that lives upon the bugs. Mealy bugs killed by the fungus are soft and spongy and "can be cut like cheese."

Other Enemies

These bugs have many other enemies which often effectively control them. Among these are lady beetles. The larvae of laced-winged flies also eat numbers of them. These larvae are flattish, soft-bodied insects about a quarter of an inch long. They have sharp projecting jaws upon which a mealy bug or aphid is freqently seen. The lace-wing lays her eggs on the under side of leaves, each egg being supplied with a slender stalk an inch or so long. These stalked eggs are laid in bunches and are commonly seen on citrus leaves.

Other enemies of the mealy bug are the larvae of syrphus flies. The adult syrphus fly is grayish or brownish in color. The larvae which eat mealy bugs, aphids and rust mites, are soft-bodied, legless grubs, and can occasionally be seen making their way over orange leaves.

The Florida Experiment Station recently introduced from California a minute parasite of mealy bugs that has done good work in the latter state. It is called the Sicilian mealy bug parasite. It will be tried out in this state.

Origin of the Florida Orange

The attention of The Citrus Industry has been called to the following item recently printed in the Ocala Banner:

"If it be true that the orange were imported into Florida from Spain, as is supposed by Mr. Moses Folsom and others, it does seem that it would not have been so generally and promiscuously distributed over the state.

"The orange tree was found growing wild along our lakes and rivers all the way from the Apalachicola and Chipola rivers in West Florida, through the central portion of the state on down to the everglades.

"And in Alachua, Marion, Hernando and other counties orange trees were found growing quite prolifically in the hammock and never at set distances.

"Then, too, it would seem that sweet and not the sour oranges would have been imported.

"So far as we know no sweet orange was ever found growing wild in any part of Florida.

"So we can but believe that the sour and bitter sweet orange is indigenous to the soil of Florida."

Calling our attention to this item, a man well versed in Florida citrus history says:

"Historical records both Spanish and English all are to the effect that wild orange trees were found growing at various places upon the peninsula by the earliest white men. These however were of the native wild sour stock. I am confident there is no record of any sweet oranges being found in the wild state.

"When Pedro Menendez de Ailles settled St. Augustine in 1565 for the Spaniards, he brought with him a large colony of artisans, farmers and laborers. Definite historical records are lacking as to whether or not this first Spanish Governor of Florida actually introduced the sweet orange. However, some of the writings of Spanish priests a few years later refer to these sweet oranges growing in the gardens of the Spanish settlements. This has led to the rather general acceptance of the belief that this first Spanish colony at St. Augustine brought with it either seeds or stocks of the sweet orange then well known along the Mediteranean; and that propagation of the sweet orange in Florida dates from about that time.

"The records generally show that the colonists who came to St. Augustine had been prepared with the idea of making most of the natural advantages of Florida, as reported doubtless by Ponce de Leon and other Spaniards who visited these shores prior to the founding of St. Augustine.

"Doubtless the propagation of sweet oranges upon wild sour stock began about that time. If so, the process very probably was carried on by grafting. Budding is a comparatively modern horticultural practice, and it is very doubtful if budding as it is now practiced was known to these colonists."

NO MITIGATION OF FRIGHTFULNESS IN OUR WAR ON THE INSECTS

For the first time in the history of aviation, an orchard of fruit-trees has been sprayed by airplane. Lieut. John A. MacReady, holder of the world's airplane altitude record, cooperating with the State Department of Agriculture of Ohio, flew from McCook Field, Dayton, to a farm south of the city where an orchard was overrun by insects. A container on the side of the ship contained powdered arsenate of lead. Getting on the windward side of the grove he released the powder. Agricultural experts standing among the trees were driven out by the dust. The insects were all killed. Agriculturists anticipate an extensive use of this system in spraying the large orchards. Lieutenant MacReady was in the air only fifty-one seconds.

The great thing for all agriculturists to remember is the interdependence of all our national activities.—Calvin Coolidge. Yes, and it would be a darn fine thing for the agriculturists, if all other classes remembered and practiced this, too.

Brogdex Company Completes Organization

Organization of the Brogdex Company was completed March 9 at a meeting of the stockholders for the purpose held in the Brogdex Building at Winter Haven commencing at 7:30 o'clock.

Over forty stockholders of the Company were present at the meeting which was called to order by Mr. John Windsor. The resignation of the temporary board of directors was read and accepted. Mr. John Windsor was elected chairman of the meeting and Mr. Don Register secretary.

The charter and by-laws of the organization having been duly read and accepted, following considerable discussion as to the manner of electing the board of directors the following fourteen men, which include some of the most prominent business men of Winter Haven and South Florida, were elected to manage and direct the affairs of the new company: Messrs. E. M. Brogden, W. N. Denham, W. M. Hampton, W. F. Hutchinson, H. W. Snell, L. B. Skinner, W. E. Lee, J. Walker Pope, Lester Windsor, H. C. Ricketts, Albert Haworth, Don Register, W. G. Roe, R. A. Henry. The charter calls for a directorate of fifteen men thus leaving a vacancy of one man to be filled at a later meeting.

Following the election of the board of directors the meeting of the stockholders was adjourned and the directors went into session. At this meeting the following officers were elected: E. M. Brogden, president; H. C. Ricketts, first vice president. Albert Haworth, vice president; W. E. Lee, vice president; W. M. Hampton, secretary; W. F. Hutchinson, treasurer. The executive board of the company comprises: W. M. Hampton, W. F. Hutchinson, H. C. Ricketts, R. A. Henry, Lester Windsor.

In the interim between the casting of the ballot and the announcing of the result of the election of directors numerous matters of interest to the company were discussed among the stockholders. Numerous letters and telegrams from fruit brokers over the country were exhibited showing plainly that there is an insistant demand among them for Brogdexed fruit. It was mentioned that Brogdexed fruit had been successfully shipped to Europe. One car having been shipped to London, being seventeen days in transit without ice, and resulting in a cabled order for two more cars specifying Brogdexed fruit.

Mr. Brogden, president of the company, spoke of the research work being conducted and told of the future possibilities of the Brogdex Method as a preserver of all kinds of fruits and vegetables. He mentioned as an instance the fact that one of the largest railroads in the country had written asking him to invesigate the possibility of using the Brogdex Method on ten thousand cars of cantaloupes. Mr. Brogden left after the meeting for the Pacific Division of the Company, and after he has things running smoothly in Southern California he expects to go to Washington and Oregon to confer with prominent apple growers regarding the use of the Brogdex Method on their fruit.

The Brogdex Company which is capitalized for $800,000.00 and which has taken over and will continue the work of the Brogden, Ricketts and Haworth Company, starts out under most auspicious circumstances. The stock of the new Company has been liberally subscribed to and is mostly owned by local people and its officers and directors are prominent and successful business men.

Chicken mites, sucking parasites, may be killed by a liberal use of flowers of sudphur on the fowls and about their house. Mites suck blood; blood is needed by the hen to make eggs. Kill the mites; save the blood; sell more eggs.

Milk has great value as a food not because of its fuel value, but rather because of its ability to repair waste tissue, to supply material for growth, and to keep the body machinery in good working order and to keep it running smoothly.

Valencia Late oranges sold on March 13th for $6.50 per box f. o. b. point of shipment. Similar high prices for Valencias are obtained practically every season. The growers who produce Valencias are the money makers of Florida's citrus industry. We can supply Valencia Late trees on rough lemon stock to buyers who place their orders now.

BUCKEYE NURSERIES INC.

Tampa, Florida

CUBA OPENS DOORS FLORIDA CITRUS FRUIT

Citrus growers of Florida should be interested in an announcement by Plant Commissioner Wilmon Newell of the State Plant Board that the drastic restrictions heretofore in effect respecting the shipment of citrus fruits from Florida to Cuba have been greatly modified.

It seems that the Cuban Government thru a presidential decree issued last summer, imposed restrictions upon the shipment of citrus fruits from Florida this being of such a nature that virtually an embargo was imposed. Since that time the plant commissioner has been negotiating with the Cuban authorities as to the nature of the imposed restrictions.

Recently the Cuban government acceded to the views of the State Plant Board and modified the restrictions so as to permit the importation of Florida citrus fruit into Cuba.

According to Dr. Newell, Florida shippers, who contemplate making shipments of citrus fruit to Cuba, should bear in mind, however, that such shipments must be made under a certificate of inspection issued by the State Plant Board. In accordance with the Cuban requirements, this certificate must set forth, among other things, that the fruit is apparently free from especially injurious plant diseases and noxious insects; also that no leaves, parts of plants or other material which might carry pests are included in the fruit package.

May Ship in Small Packages or in Bulk

Fruit shippers will also be interested in knowing that the prohibition on bulk shipments has been rescinded. Fruit may now be shipped to Cuba in standard packages or in bulk, but in either event must be certified to as having been inspected by an inspector of the State Plant Board.

Fruit shippers who contemplate exporting citrus fruit to Cuba may call upon their nearest inspector of this Board to make the necessary inspection. In localities where there are no inspectors stationed permanently, shippers should communicate directly with the plant commissioner at Gainesville advising of their desire to have inspections made, in order that an inspector may be assigned to this task. Ample time should be given in order that the necessary arangements may be made.

Plenty of milk, eggs and butter along with a good garden, will take a lot of the pinch out of living this year —or any other year.

Thrip Injury in Citrus Groves

By H. E. Stevens, County Agent

It is now time to consider control measures to prevent thrip injury in the citrus grove. The Thrip is a minuate, soft bodied insect yellow in color which is found in the blossoms of many plants. The citrus bloom is one of its favorite feeding places and if the insects become abundant considerable damage may be caused to the citrus crop in certain sections.

The thrips may cause two types of injury in the citrus grove. Heavy infestations of these pests may cause the bloom to shed and greatly reduce the crop. The more common type of injury occurs as marks on the fruit and most of the citrus growers are well familiar with this type. This injury is caused in the bloom and while the fruit is very young. The insects rasp away the outer cell tissue and suck the juices. A small injury made on the young fruit or while it is still in the bloom may develop into an unsightly scar when the fruit is matured.

Where the bloom is heavy on the trees even if an abundance of thrips are present little noticeable injury may result, but if the bloom is light and the thrips are numerous from one half to two thirds of the crop may be affected. This injury can easily be avoided if proper steps are taken in time.

There are certain sections in the county where thrips injury is more or less abundant each season and in groves where the thrips have been troublesome in the past it may be well to resort to some control measures this season. First grade fruit always sells better than second or third grade and there is no reason why the thrips should be allowed to reduce the grades.

The tobacco extracts such as Black Leaf 40 has been found very effective in controlling thrips where they are sufficiently numerous to warrant spraying for. If an average of twelve thrips per bloom are found and if there is a light bloom on the trees it will pay well to spray for the thrips.

But first see that all Spanish needles in bloom are removed from the grove before the citrus bloom opens. The thrips are found abundantly in the flowers of the Spanish needle and they rapidly pass from these to the open citrus bloom. For effective control it is important to remove the Spanish needles from the grove which may be done with a mower, through cultivation or with a hoe.

The first spraying should be made into the open bloom and during the early part of the bloom period. It is useless to spray before the bloom has opened and results are far less satisfactory where the spraying is delayed until much of the bloom has fallen. Get the thrips before it has time to do its work. One thorough spraying is generally sufficient if the blooming does not extend over too long a period. Examine the sprayed trees about ten days after the spray has been applied and if the thrips are still numerous a second application will be necessary.

The following mixture has been recommended as a very efficient one for the control of thrips:

Lime Sulphur solution 1 pint, Black Leaf 40 one-fourth pint, water 50 gallons.

The solution should be applied at a pressure of 180 to 200 pounds for best results and direct into the open bloom.

Where a scab spraying is to be made into the open bloom with the lime sulphur solution the thrips may be taken care of at the same time by adding one-fourth pint of Black Leaf 40 to each 50 gallons of spray solution.

HOW TO MAKE SPRAY MIXTURES

1—Bordeaux Mixture

Copper sulphate (bluestone)---4 Lbs.
Quicklime (not air slaked)----4 Lbs.
Water to make ----------50 Gals.

Using only wooden or eathen vessels, dissolve the bluestone in a few gallons of hot water, adding water to make up 25 gallons. Slake the lime carefully, permitting neither "drowning" nor "burning" and after all action has ceased, make up to 25 gallons. Pour these dilute solutions together in mixing barrel at the same time, through a strainer, stirring vigorously. Use the same day. Stock solutions of lime and bluestone may be made up and kept on hand, in which one pound of lime or bluestone respectively will be dissolved in one gallon of water.

2—Commercial Lime-Sulphur Solution

Lime-sulphur may be bought as commercial concentrated stock solution, which is used one part to eight parts of water for winter strength, and one part to 40 parts for summer strength. Where a small amount of spraying is done it is more convenient to buy the commercial material.

3—Homemade Lime-Sulphur Solution

Orchardists whose orchards require the use of large quantities of lime-sulphur solution often find it an advantage to make up their own concentrated stock solution. This may be done according to the following formula from the Illinois Experiment Station:

Stonelime, best grade --------50 Gals.
Sulphur ----------100 Gals.
Water to make, when boiling is done ---------- 66 Gals.

In a large kettle place about 15 gallons of water, bring to a boil, dump in the lime. Add the sulphur and mix thoroughly, adding hot water as necessary to prevent the mixture from burning as the lime slakes. When the lime has slaked and the sulphur is well mixed, add hot water to bring total volume up to a little more than 66 gallons, to allow for evaporation. Boil continuously for 30 to 45 minutes, adding cold water if boiling-over occurs. When finished the color may vary from orange to chocolate. Test material by taking some out in a dipper, then pouring back slowly. If no sulphur globules remain, it has cooked enough. Remove from fire at once. A small amount of impurities or sludge in bottom of kettle does not interfere with use in spraying.

This stock solution will keep through the season. Dilutions are made one part to four parts water for winter strength, and one part to 19 parts water for summer strength spray. Arsenate of lead and nicotine sulphate may be added at the usual rate when needed.

4—Self-boiled Lime-Sulphur Solution

This solution is used for the control of brown rot on peaches and, unlike most other sprays, it does not injure the peach foliage. It is made as follows:

Quicklime, best grade ------ 8 Lbs.
Sulphur, finely powdered ---- 8 Lbs.
Water, to make ---------- 50 Gals.

While the lime is slacking vigorously add the sulphur gradually. Prevent "burning" or "drowning" of the lime by the judicious use of warm water. Stir well. When action subsides add cold water at once to bring mixture to 50 gallons and use immediately. This is solely a mechanical mixture, differing from other sprays where lime and sulphur are the ingredients.

Of course the purebred sire is the first step, but there's no good argument against purebred females in livestock improvement.

True Today, as it has been for 35 Years

Maximum Results
Minimum Cost
REAL MARKETING SERVICE

CHASE & CO.

Main Office, JACKSONVILLE.

Bonded Salesmen in 102 Carlot Markets.

VALENCIA ORANGES

On March 14, were bringing Florida growers $6.50 net per box. On the same date, Lue Gim Gongs were but a lap behind. At these prices will it not pay you to plant these varieties?
We have choice stock of these varieties of all sizes, ready for delivery for complete plantings or for filling in vacant spaces in your groves.
We still have a good stock of other varieties—Pineapple Oranges, Grapefruit and Tangerines. These are as fine trees as were ever grown in Florida. Now is the time to place your order for final winter plantings. Many growers prefer March plantings to other seasons.

HARDY AVOCADOS

The Frost-Resistant Type

We still have some choice stock of the winter-bearing varieties, in the hardy, frost-resistant types. Avocado culture promises to become as important an industry in Florida as the citrus industry. NOW is the time to start a grove. Write, wire or phone us your nursery orders.

THE THOMAS GUARANTEE STANDS BACK OF EVERY THOMAS TREE

THE C. E. THOMAS NURSERIES

404½ ZACK STREET TAMPA, FLORIDA
Agents Wanted Everywhere

If Citrus Men Can Use It—
The Citrus Industry
Can Sell It.

The only publication in the world devoted exclusively to citrus fruits.

General Offices,
Curry Bldg., Tampa, Fla.
Staff writers in every citrus territory.

SPRAYING THE AVOCADA PEAR FOR SCALE

Pyriform scale, also known as "measly shield scale," blackens avocado trees even more completely than whiteflies blacken citrus trees, unless kept under control by spraying with some of the oil emulsions. The scale is found also on the guava bush, and occasionally gets on citrus, cinnamon and several plants related to the fig.

Pyriform scale is controlled by the same sprays—oil emulsions—that are used in controlling whitefly on citrus. And these sprays are used at the same strength as for whitefly.

In spring, just before the blossoms appear, the avocado should be sprayed, ordinarily, with bordeaux to control the fungus disease which causes withertip and which is often responsible for the loss of a crop of fruit. "At this time of year one can therefore kill two birds with one stone by spraying with bordeaux-oil instead of just the plain bordeaux mixture, thus controlling withertip and killing the pyriform scale," says Professor J. R. Watson, entomologist of the Florida Experiment Station.

For this purpose, Professor Watson says the bordeaux-oil should be made up as for citrus, using but half the strength of oil, however. That is, make the ordinary 4-4-50 bordeaux and in it put enough oil to make 1-2 of 1 per cent, or just half the amount of oil recommended in the straight oil spray.

Whale-oil soap, also, will control these insects and will be harmless to the avocado and guava. Use about 1 pound of the whale-oil soap to 10 gallons of water, if the water is soft. If the water is hard, it is better to use 1 pound of the soap to 8 gallons of water.

It is quite possible that lime-sulphur will control this scale, if used in the proportion of about 1 part to 30 or 40 of water.

CLASSIFIED ADVERTISEMENTS

The rate for advertisements of this nature is only three cents per word for each insertion. You may count the number of words you have, multiply it by three, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

THE CITRUS INDUSTRY,
411 Curry Bldg., Tampa, Florida

REAL ESTATE

WANT to hear from owner having farm for sale; give particulars and lowest price. John J. Black, 180th Street, Chippewa Falls, Wisconsin. Dec. 3t

GROVE FOR SALE—40 acres in tract all fenced, 10 acres in six year-old-grove, half in Valencia Oranges, the other half in grapefruit. Located in famous Lake Garfield section, about 7½ miles from Bartow, on improved highway. Price $9,000, half cash, balance in one, two and three years, 8 per cent. For further information call at 59 Wilson Avenue, or write P. O. Box 263, Bartow, Fla.

THE GROVE YOU WANT—You'll find it fully described and correctly priced in our booklet "GROVES AND FARMS" just issued. Contains full information as to principal groves in seven counties in Central and South Florda. Send for copy. Dotson & Hammock, 816½ Franklin St., Tampa, Florida. Oct.-6t

FOR SALE—five-room house with bath complete, also screened sleeping porch, corner lot 100x150, street paved on two sides, two-room building in rear used for garage and shop. Price $5,000, half cash, balance in one, two and three years at 8 per cent. For further information call at 59 Wilson Avenue, or write P. O. Box 263, Bartow, Fla.

SELL YOUR PROPERTY, city, grove, farm or unimproved, by our quick and satisfactory method; it brings cash buyers. Send for particulars. You are in time to have your property listed in our booklet which has circulation of over 7,000, if you act quickly. Dotson Hammock, 816½ Franklin St., Tampa. Phone 4772. Oct.-2t

BEAUTIFUL YOUNG GROVE FOR SALE—Located on the Ridge near Haines City. 40 acres in the tract all fenced, 28 acres in six-year-old grove, half Valencia Oranges and half grapefruit. Magnificent lake in this property, nice building site. Trees are all in good condition and well fruited this season. Be sure and see this grove, it is a good buy at $21,000. Will accept half cash and balance in one, two and three years at 8 per cent. For further information call at 59 Wilson Avenue, or write P. O. Box 263, Bartow, Fla.

NURSERY STOCK

EARLY BEARING Papershell Pecan trees, budded or grafted and guaranteed. Great shortage this year. Write for catalog today. Bass Pecan Company, Lumberton, Miss.

MISCELLANEOUS

BROTHER:—Pleasant Florida root easily, inexpensively overcomes any tobacco habit. Fine for stomach. Send address. R. B. Stokes, Mohawk, Florida. 2t

FOR SALE—Dairy and stable manure, car lots. Link & Bagley, Box 2461, Tampa, Florida. Jan. 6t

MAKE EVERY DOLLAR COUNT! Buy your furniture here—pick from our complete stocks—be better satisfied. All goods marked in plain figures. We pay your transportation to and from Tampa and deliver your purchases free. HODGE & SHERMAN, Tampa, Fla.

FOR SALE—"Friend" sprayer 100 gal. capacity, new condition. Chas. Scott, R. F. D. 2, Bartow, Fla.

COME TO TAMPA AT OUR EXPENSE! We refund transportation to purchasers and pay freight. All goods marked in plain figures. You can save money here and be better satisfied. HODGE SHERMAN, Tampa, Fla. Nov. tf

Civil and Criminal Investigations
FRED THOMAS
National Detective Agency
P. O. Box 1582 Tampa, Florida
Telephones 2221 and 4140

Best Fertilizers · Insecticides
Sprayers · Poultry Supplies
Honest Goods, Fair Prices, Prompt Shipment
Ask Your Neighbor—He Knows.
E. O. Painter Fertilizer Company
Jacksonville, Fla.
Get Dec. 1st, 1921, Reduced Price Lists before buying
Now furnishing 'Simon Pure' and 'Gem Brands

LADIES! I positively guarantee my great successful "Monthly" Compound. Safely relieves some of the longest, most obstinate, abnormal cases in 3 to 5 days. No harm, pain or interference with work. Mail $2.00; Double strength $3. Booklet Free, Write today. Dr. D. D. D. Southington Remedy Co. Kansas City, Mo.

COPPER OIL CANS LAST A LIFE TIME IDEAL FOR GARAGES
Circular Free
STANDARD METAL WORKS
6 BEACH ST. BOSTON, MASS.

ORANGES, GRAPEFRUIT TANGERINES
Early varieties, picked fresh prom our groves daily. Packed in all size boxes from 75c up. Shipped express to any address. Special prices by the hundred. No order too small or too large. WATERS FRUIT & PRODUCE CO., Phone 2429, 502 Cass St., Tampa, Fla.

HOTEL HILLSBORO
Tampa, Fla.
TOP O' THE TOWN
European Plan, Fireproof 300 Rooms With Baths
THE CENTER OF TAMPA